

# Investigation of extraction methods of walnut cake polyphenol components for further usage in edible coatings



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## Introduction

Walnut oil cake is the primary by product/side stream obtained during the processing of walnuts for oil. This cake is usually discarded, it is densely packed with nutrients and natural preservatives, especially polyphenols. These polyphenols can be applied as an antioxidant and/or antimicrobial agent in the coating of walnut kernels, to extend the shelf life of walnuts without negatively affecting the nutritional profile of walnuts. The coating based on these polyphenols also have the potential to arrest the oxidation of the unsaturated fatty acids present in the walnuts.

## Aim

The aim of this study was to analyze different methods to extract polyphenols from walnut cake pellets. To use that polyphenol extract in edible coatings



## Materials & Method

In our experiments, walnut cakes from two different Hungarian varieties 'Alsószentiványi 117' (A) and 'Milotai 10' (M) were used. First, they were soaked in 70% ethanol with 3 different sample: solvent ratios (1:10, 1:20 and 1:30) for 1 hour and then water bath (W, at 40°C for 1 hour) and ultrasonication (U, at 35 KHz for 30 minutes) were used to extract polyphenols. After the extraction, color values (L\*, a\*, b\*) and TPC values (Singleton and Rossi, 1965) were measured control (C) without treatment after water bath (W) and after ultrasonic treatment (U).



## Results

Fig 1 & 2: TPC of walnut extracts

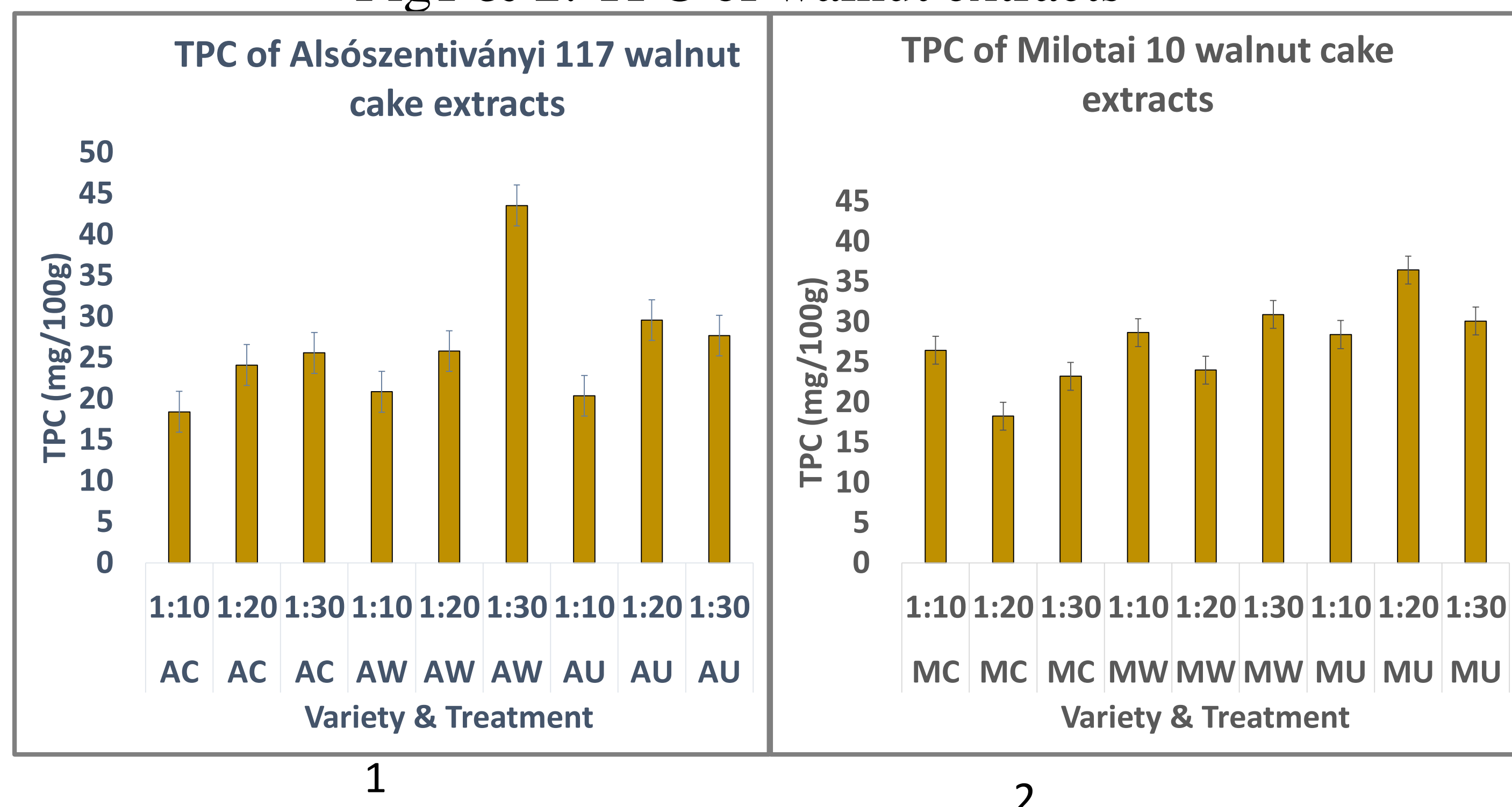
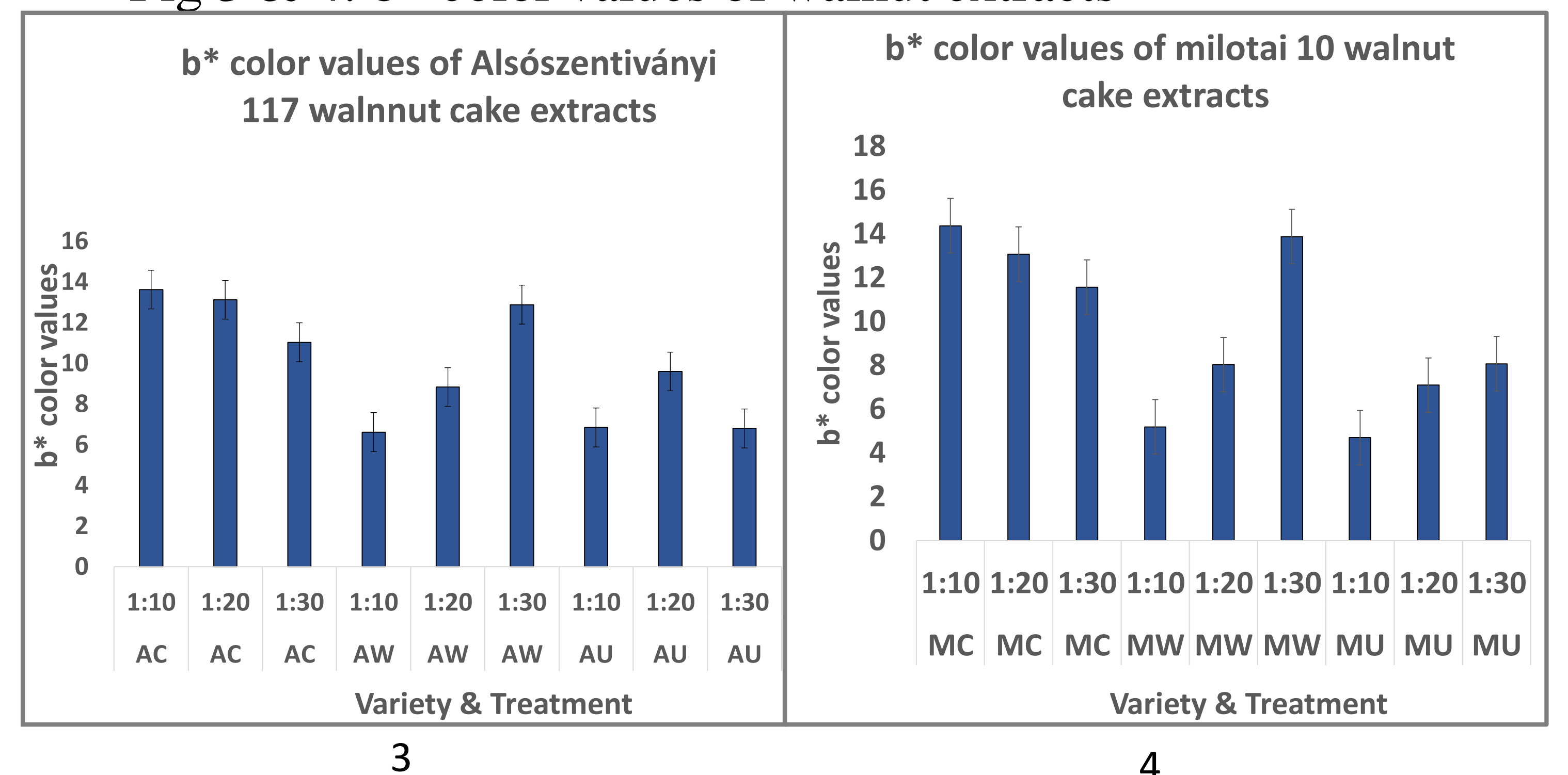


Fig 3 & 4: b\* color values of walnut extracts



In the graphs shown above, The following depicts- A- Alsószentiványi 117, M- Milotai 10, C- Control, W- Water bath, U- Ultrasonication, 1:10;1:20; 1:30 - Sample:solvent Ratio

## Discussion & Conclusion

The extraction methods had no significant effect on the color values of the extracts in our studies. The TPC content (Fig 1 & 2) of extract obtained using the ultrasonic method was higher. There was no distinguished effect of sample:solvent ratio on TPC in our experiments. We found that ultrasonic method was better for walnut extraction compared to water bath. But there were no significant and streamlined effect of extraction procedures on the brightness (b\* color values of the samples) (Fig 3 & 4). After analyzing the results, we found that to be used in the edible coating formulations, polyphenols extracted using the ultrasonication method can be much effective than water bath method.

## References

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