

**Faraja Gonelimali\*, Beatrix Szabó-Nótin, Mónika Máté**

**Department of Fruit and Vegetable Processing Technology, Institute of Food Science and Technology,  
Hungarian University of Agriculture and Life Sciences, Budapest, Hungary.  
H-1118, Budapest, Villányi street 29-43., Hungary.**

\*Corresponding author e-mail: [fgonelimali@gmail.com](mailto:fgonelimali@gmail.com)

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## Introduction

Polyphenols from agro-industrial wastes especially of fruit origin are a reliable source of antioxidant and antimicrobial compounds that can be used in the development of natural food additives. Organic solvents play a vital role in obtaining polyphenols from the plant matrices however, the resulting crude extracts need purification to overcome inefficiency and reduce the impact on organoleptic properties. Purification of the crude extracts can be achieved by resin purification. Resins especially amberlite, are known for purification of proteins and pharmaceutical products [1]. Some studies suggest that resins can be useful in the purification of compounds from the plant extracts [2].

## Aim

The aim of this study was to investigate the effect of resin type (Amberlite XAD 7HP and Amberlite XAD 761) and desorption solvent (Ethanol and Acetone) on purification of polyphenols from the industrial apple pomace for the recovery of total phenolic content (TPC) and Antioxidant activity (FRAP).

## Materials and Methods

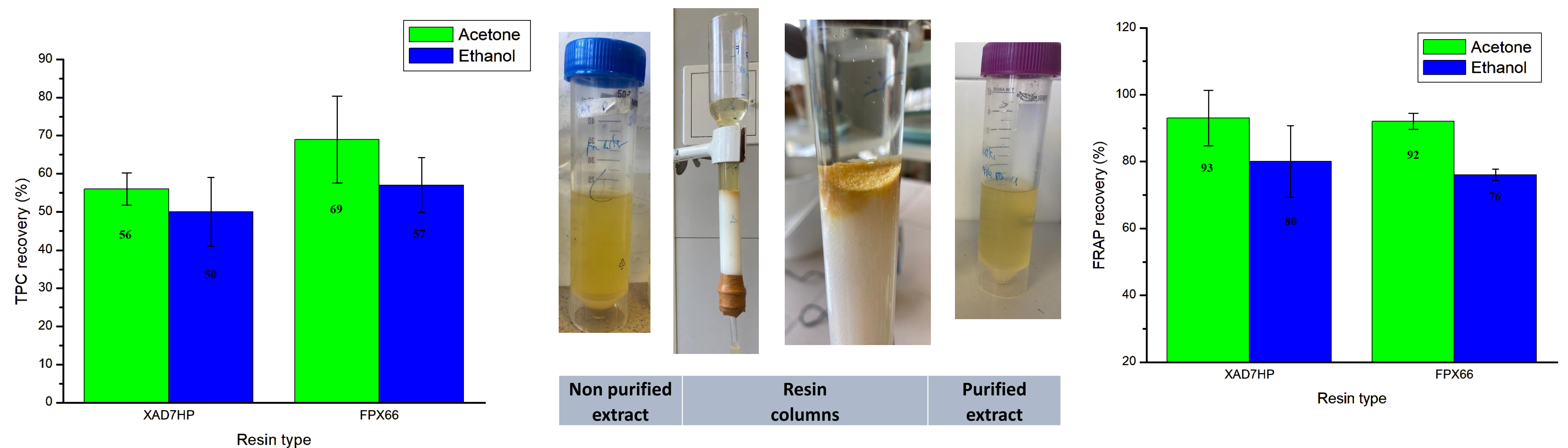
Dried apple pomace from the juice processing factory (Agrana Juice Ltd) were subjected to ultrasound-assisted extraction using 80% ethanol [3]. Sample - solvent ratio was 1:3 w/v, Sonication was done at 20 kHz in a sonicating water bath, temperature 20°C, and time 30 minutes. The obtained solution was centrifuged, filtered, followed by rotary evaporation and oven drying at 60°C. Dried extracts were redissolved in water to make a final concentration of 5 mg/ mL.

Purification was done by the modified method of Seif Zadeh and Zeppa [4] using resins Amberlite XAD7HP and Amberlite XAD761. Elution solvents were ethanol or acetone. 20g of activated resin were packed in a glass column (25× 310 mm). Sorption and desorption flow rate were 2 Bed volume per hour.

Total polyphenol content (TPC) was determined by the Folin-Ciocalteu's method of Singleton and Rossi [5]. The absorbance was read using Hitachi U-2900 spectrophotometer at 765 nm and results were expressed as  $\mu\text{g GAE mL}^{-1}$ . Recovery was determined by comparing TPC in the eluent versus that in crude extracts expressed in percentage.

Antioxidant activity was determined by the Ferric reducing ability of plasma (FRAP) method of Benzie and Strain [6]. Absorbance was read at 593 nm and the results were expressed as  $\mu\text{g AAE mL}^{-1}$ . Recovery was determined by comparing the FRAP of the eluent versus that of crude extracts expressed as percentage.

## Results



## Conclusion

The research and subsequent use of natural food additives have gained great interests in the recent years due to threats and consumers' perception of increased demand and use of synthetic food preservatives. Apple pomaces are rich in bioactive compounds including polyphenols that are potential and reliable sources for the development of natural food additives. One of the limiting factor for the utilization of polyphenols from plant sources is purification. Crude extracts are inefficient in exerting biological functions and interferes with the organoleptic properties of food. This study found that, resins particularly amberlite FPX66 and acetone as an elution solvent are ideal for the recovery of TPC and antioxidant activity (FRAP) of the apple pomace extracts.

## References

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