

PHENOLIC PROFILE AND ANTIOXIDANT ACTIVITY IN CIDER FERMENTED WITH APPLE POMACE

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Apple pomace, the main by-product from apple industry, has a great amount of phenolic compounds. Which, it confers antioxidant properties, bringing benefits to human health, reducing the risks of several diseases such as diabetes and cancer. Furthermore, these compounds can also be used to improve the sensorial and functional properties of foods and beverages. The aim of this study was to evaluate the evolution of the phenolic compounds from apple pomace added in cider during the fermentation. Apples from Fuji variety were processed and fermented with *Saccharomyces cerevisiae* (Fermol Reims Champagne, Ref. PD 2002 AEB Group, San Polo, Brescia, Italy) during 15 days. Twenty fermenters (200 mL each) were divided in two groups: i) without apple pomace (Cider I), and ii) with addition of dried and immobilized apple pomace (Cider II). In the 1st, 4th, 7th, 11th and 15th days, the beverages of each group were monitored by analysis of color, total phenolic compounds (TPC), flavonoids, flavanols, flavonols, in vitro antioxidant activity (ABTS, CUPRAC and FRAP assays) and individual phenolic compounds (RP-HPLC-DAD). It was observed the difference between the ciders for color and phenolics. Based on color parameters both ciders were yellowness ($a^* = -3.04$; h° around 98°). However, the Cider II was lightest ($L^* = 93.40$) and more intense ($C^* = 23.07$) than Cider I. TPC, flavonoids, flavanols and flavonols were around 32 %, 22 %, 128 % and 29 %, respectively, higher in Cider II. The extraction of flavanols was higher because it is the main class of phenolic compounds in apple pomace. The increasing of phenolic content influenced positively in the in vitro antioxidant activity, which increased from 23756.10 to 34001.35 $\mu\text{molTE/L}$ in ABTS, 2987.67 to 4389.06 $\mu\text{molTE/L}$ in CUPRAC and 820.05 to 1270.57 $\mu\text{molTE/L}$ in FRAP assays. During the fermentation period phloridzin, rutin and avicularin were increased with addition of apple pomace, whereas, quercetin and quercetin xyloside were exclusively extracted from apple pomace. Chlorogenic acid decreased during fermentation, while caffeic and coumaric acids showed significant increase which can possibly be explained by cleavage reaction. Therefore, the use of apple pomace during cider fermentation is a

way to valorize phenolic compounds from apple pomace and improving the antioxidant activity of ciders.

Palavras-chave: *Mallus domestica*, hplc, by-product, antioxidant activity