



PHENOLIC COMPOUNDS PROFILE AND ANTIOXIDANT ACTIVITY OF WITBIER DURING STORAGE

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Beer is obtained through the alcoholic fermentation of wort, produced with barley or wheat malt, and hops. In recent years, the nutritional aspects of beers have aroused interest due to their possible health benefits. Beer contains phenolic compounds such as phenolic acids, flavonols, flavones, prenylflavonoids such as xanthohumol and hydrolysable tannins such as proanthocyanidins. The antioxidant activity of phenolic compounds influences the sensory quality of the beverage, delaying changes in taste and aroma during storage in the bottle. The aim of this study was to determine the content of total phenolic compounds, the antioxidant activity and to investigate the polyphenol profile in 2 of Witbier samples, immediately after production (W0) and after 3 months storage (W3). The total phenolic content was measured using the method with the Folin-Ciocalteu reagent and the antioxidant activity through the DPPH, FRAP, ABTS and ORAC methods. The phenolic profile was accessed by UPLC-MS/MS. Total phenolic content for W0 and W3 were 602 and 547 mg GAL/L respectively, indicating a significant ($p<0.05$) reduction during storage. Antioxidant activity in mmol Trolox/L showed a significant ($p<0.05$) result only for the DPPH method (W0: 0.10 and W3: 0.15), with an increase in activity after 3 months. Forty-one different phenolic compounds were identified and after 3 months of storage the relative abundance of epicatechin, galocatechin, cinnamic and chlorogenic acid decreased while homovanillic acid increased and methoxyphenylacetic acid remained unchanged. During the storage period chemical changes such as epimerization, hydrolysis, oxidation and polymerization may cause degradation or formation of new phenolic compounds. Witbier samples showed a wide variety of phenolic compounds and, although there was a significant reduction in their total content over the 3-months storage, this did not translate into a reduction in antioxidant activity. Furthermore, some phenolic compounds were formed or did not vary in abundance over storage time.

Keywords: Bioactive compounds, Polyphenols, UPLC-MS/MS

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