# QUANTITATIVE ANALYSIS OF PHENOLIC COMPOUNDS IN DIFFERENT BARLEY VARIETIES – RELATIONSHIP WITH ANTIRADICAL POWER

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The deterioration of beer flavour is influenced by the presence of antioxidants during malting, brewing and subsequent storage. Delaying flavour staling, to prolong shelf life, is one of the greatest and difficult challenges facing the brewing industry today. Antioxidants can be added during brewing to successfully produce beers possessing a high level of antioxidant activity. However, in recent years, there has been a general trend towards minimising the use of added antioxidants [1].

Barley contains various endogenous antioxidants, such as phenolic compounds, which represent over 80% of the total phenolic content in beer [2]. Phenolic compounds or polyphenols constitute one of the most numerous and widely distributed groups of substances in the plant kingdom with more than 8000 phenolic structures currently known. They are products of the secondary metabolism of plants and arise biogenetically from two main primary synthetic pathways: the shikimate pathway and the acetate pathway. These compounds are subject of current investigation over the last decades mainly due to their antioxidant, anti-inflammatory activity and scavenging of oxygen radicals. The determination of polyphenols in raw materials seems to be an attractive field of analytical chemistry.

In this work is described a new extraction technique with optimized HPLC-DAD conditions allowing the determination of 14 polyphenols in barley susceptible to contribute to beer flavour stability. This method enables us to achieve selective

and sensitive determination of the studied phenolic compounds. Ground barley samples are extracted twice with methanol and concentrated 5 fold, prior to injection. The accuracy and precision of the developed method has been evaluated by recovery and relative standard deviation.

The antiradical power was determined in different barley varieties, and in the corresponding malts, by using the DPPH method, which is an index of the hydrogen-donating ability of the molecules present in the food matrix [3]. A good correlation was obtained, suggesting a major contribution from barley endogenous polyphenols for the antiradical power. In addition, the results obtained also showed a significant correlation ($r^2$=0.96) between the polyphenols content and the antiradical power.

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