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Czech J. Food Sci.

**Čechovská L.,
Konečný M., Velíšek J.,**

Effect of Maillard reaction on reducing power of malts and beers

Czech J. Food Sci., 30 (2012): 548-556

HPLC with amperometric detection was used to evaluate the reducing power of 23 beers and aqueous extracts of 17 barley malts. While brew pale malts were only slightly higher in electrochemical reducing capacity than natural barleys (about 1.3 g BHAE/kg), caramel malts with the colour of 60–450° EBC showed 7.5–17.2 g BHAE/kg. The superior reducing power of the darker caramel malts was partly due to the presence of a Maillard-derived 2,3-dihydro-3,5-dihydroxy-6-methyl-(4*H*)-pyran-4-one (DDMP), which was responsible for 21–55% of their electrochemical capacity. Among common brew malts, only the Munich type showed a significantly increased electrochemical capacity – 6.8 ± 0.8 g BHAE/kg. In addition to the

electrochemical capacity of beers, which ranged from 0.4 ± 0.1 to 1.9 ± 0.3 g BHAE/l. Simple indigenous malt-derived phenolics were responsible for 48–57% of capacity in pale lagers and for 33–45% of it in dark and other specialty lagers. DDMP was not detected in most pale lagers, while it was responsible for up to 11% of the electrochemical capacity in dark and special beers. High-molecular-weight fraction (> 1 kDa) of beers comprised 19–39% (pale lagers) and 14–21% (dark and special beers) of the capacity. The reducing power of malts and beers determined by the amperometric method was confirmed by a good correlation with the results of DPPH• scavenging assay.

Keywords:

malting; brewing; electrochemical detection; electrochemical capacity; non-enzymatic browning; 2,3-dihydro-3,5-dihydroxy-6-methyl-(4*H*)-pyran-4-one

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