APPLICATION LIST #497

Amino acids analysis in beer

Nitrogen compounds are considered to be the main players in flavor and haze formation, foam stability, color, yeast nutrition and the biological stability of a beer. These compounds consist of amino acids, peptides, polypeptides, proteins, nucleic acids and their degradation products [1]. It has been proved that the flavor diversity in beer depends on the alcohol and ester formation caused by these nitrogen compounds, but it is also strongly influenced by amino acids and proteins originating from the raw materials and the technological processes of beer brewing. Using our LC-MS MetAmino® kit, we tested a sample of Budvar beer. Here we present a comparison of the mass chromatograms of the standard mixture (Fig. 1) and Budvar 12° beer (Fig. 2). The most abundant amino acid in Budvar beer was proline (2197 µmol/L) and alanine (914 µmol/L), which is consistent with other beer analyzes in the literature [3].

The sample preparation by MetAmino® Kit:

- Beer (25 µL) was dried to dryness under a gentle stream of nitrogen.
- Internal standards (10 µL) were added.
- The sample preparation protocol was continued with the addition of CTS and RDS according to the general protocol scheme [2].

The chromatographic conditions: LC-MS method according to the general protocol scheme [2].

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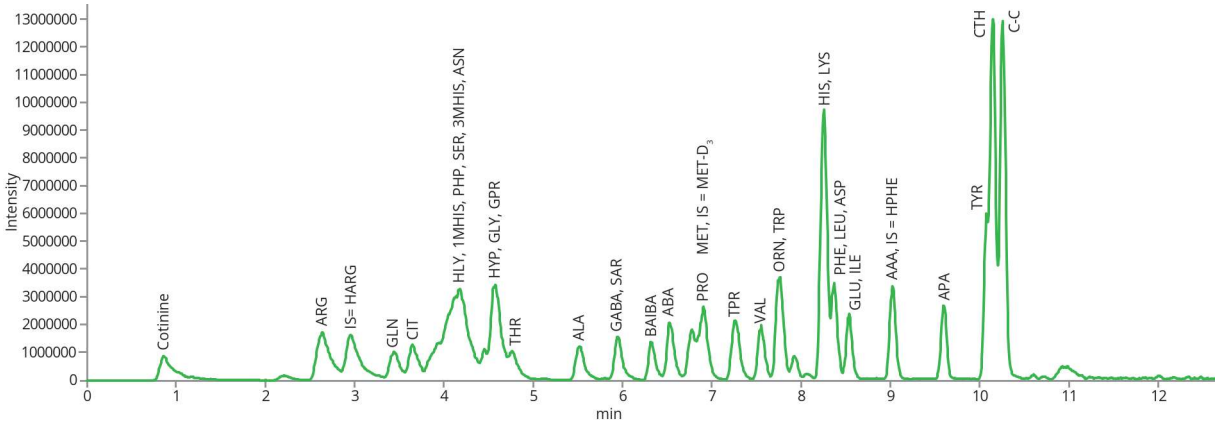

Fig. 1: Standard mixture – LC MetAmino® kit; mass extracted chromatogram; 5 nmol SD1 and SD2 according to the manual [2]

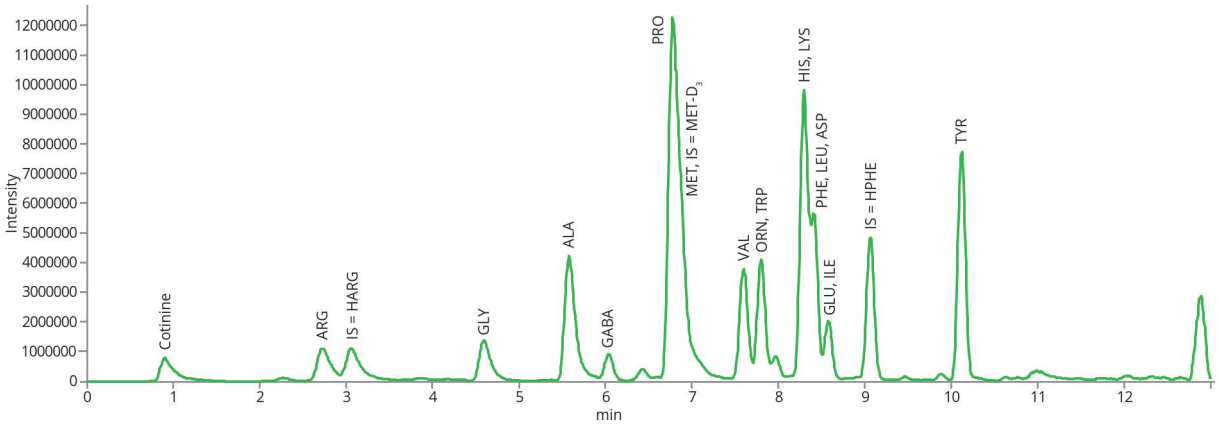

Fig. 2: Beer Budvar (12°) – LC-Metamino® kit; mass extracted chromatogram; (25 µL of sample)

References:

[1] Fontana, M., Buiatti, S. 25 – Amino Acids in Beer, Beer in Health and Disease Prevention, 2009, 273-284.

[2] Chromservis: https://www.chromservis.eu/en/metamino-kit-400139

[3] Schad, G.J. Fast and Simple Determination of Free Amino Acids in Beer, LCGC, 10, 2015.