P-031: Detection of ergot alkaloids in flour and pastries

Christine Schwake-Anduschus, Elisabeth Sciurba, Jens Begemann, Anja Bonte

Max Rubner-Institut, Detmold, Germany
E-mail: anja.bonte@mri.bund.de

Ergot alkaloids (EA) are secondary metabolites of filamentous fungi, primarily *Claviceps purpurea*. This species may infect plants of the grass family, including cereals like rye and wheat, and build sclerotia containing alkaloids. As EA have a vasoconstrictive effect, some substances are used in medical treatment, e. g. against sick headache or for stimulating uterine contractions. However, the consumption of highly contaminated foods with EA causes ergotism, an illness that led to death in the middle ages. Even nowadays a case of ergotism outbreak arose in Arsi and Ethiopia due to the consumption of infected cereals and further studies showed that EA still occur in rye-, wheat-, oats or even millet containing foods [1]. In 2012 the European Food Safety Authority (EFSA) established a tolerable daily intake (TDI) of 0.6 µg/kg body weight and an acute reference dose (ARfD) of 1 µg/kg body weight for the sum of 12 ergot alkaloids [2]. While the ARfD was not exceeded for any population group, high consumption scenarios revealed a dietary exposure above the TDI for toddlers [3]. Maximum limits of 0,5 g sclerotia/kg unprocessed grains were already set and thresholds for EA in grains, flours and processed cereals are scheduled [4,5]. More information about the relation factors between the EA concentrations in raw and processed materials are required to provide information for reasonable legislation [4]. In this study an uHPLC-Qtof-MS/MS method has been developed to identify at least 12 EA (Fig. 1) in flour and pastries. Further EA shall be detected to examine the conversion of EA from raw material to processed food.

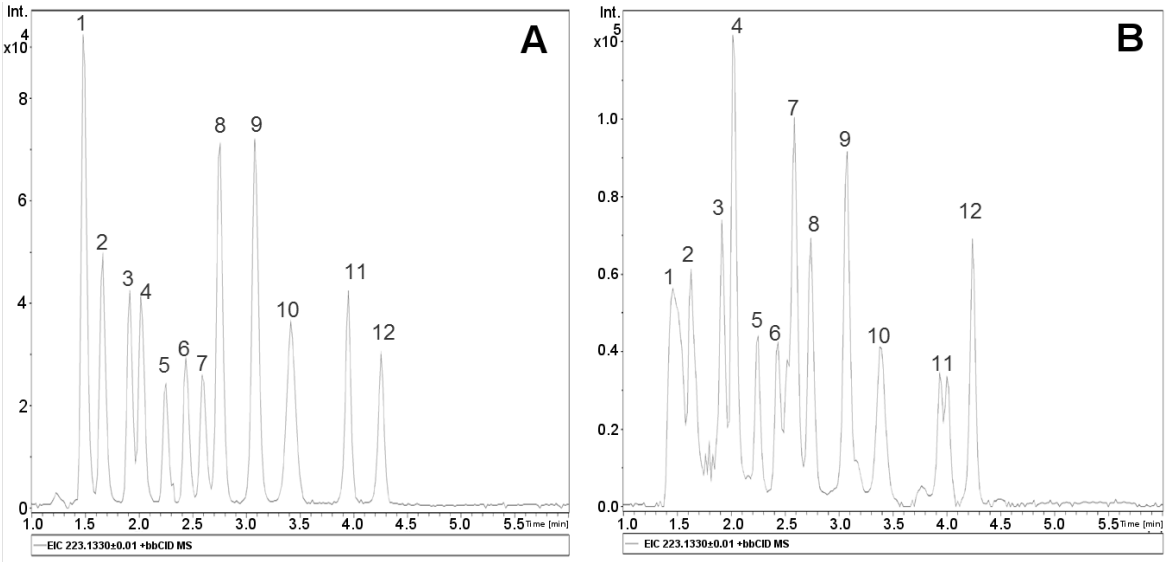

Figure 1: Ergot alkaloids (EA) detected with uHPLC-Qtof-MS/MS. 1. Ergometrin, 2. Ergometrinin, 3. Ergosin, 4. Ergotamin, 5. Ergocornin, 6. Ergokryptin (α,β), 7, Ergocristin, 8. Ergosinin, 9. Ergotaminin, 10. Ergocorninin, 11. Ergokryptinin (α,β), Ergocristinin. A: standard substances in solvent (c=10 ng/ml). B: naturally contaminated rye flour. Int.: Intensity

References

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