

Meeting abstract

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DIMBOA and DIBOA, two naturally occurring benzoxazinoides, cause aneuploidy in a human-derived liver cell line (HepG2)

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Introduction

Dihydroxy-7-methoxy-1,4-benzoxazin-3-one (DIMBOA) and 2,4-dihydroxy-1,4-benzoxazin-3-one (DIBOA) are naturally occurring benzoxazinoides (BA) and are found in sprouts of *Gramineae*. We investigated their genotoxic effects in a human-derived liver cell line (HepG2).

Methods

The *Salmonella*/microsome assay (Ames test) was used for pre-screening (TA98, TA100 and YG1024; ± S9). Juices of wheat and maize sprouts were also tested. The effects on HepG2 were tested with the single cell gel electrophoresis assay (SCGE), the micronucleus assay (MN) and pangen-tromeric probes (CP) with fluorescence in situ hybridiza-tion (FISH).

Results

In the Ames test DIBOA was positive. Effects in YG1024 were little higher as in TA98. DIMBOA was positive in TA100 only. Addition of S9 led to higher mutagenic activ-ities. The sprout juices were clearly positive, however not due to the BAs. The SCGE assay was negative, but the MN assay was positive (DIMBOA at >2.5 µM, DIBOA at >5 µM). The CP showed >80% centromere positive (C+) micronuclei.

Conclusion

The slight differences between YG1024 and TA98 indicate that acetylation plays no role in the activation. The BAs can be classified as weak bacterial mutagens. It is unclear why the sprout juices were positive. Due to the results of the assays with HepG2, we tested for aneuploidic effects. This was confirmed by the CP result. Aneuploidy is thought to be a key event in cancer induction and no other aneugenic plant-derived substances of dietary relevance are known.