Enniatin B and beauvericin are common in Danish cereals and show high hepatotoxicity on a high-content imaging platform - DTU Orbit (24/12/2018)

Enniatin B and beauvericin are common in Danish cereals and show high hepatotoxicity on a high-content imaging platform

Mycotoxins are fungi-born metabolites that can contaminate foods through mould-infected crops. They are a significant food/feed-safety issue across the globe and represent a substantial financial burden for the world economy. Moreover, with a changing climate and fungal biota, there is now much discussion about emerging mycotoxins that are measurable at significant levels in crops world-wide. Unfortunately, we still know very little about the bioavailability and toxic potentials of many of these less characterized mycotoxins, including the large family of enniatins. In this study, we present new occurrence data for enniatin A, A1, B, B1 and beauvericin in four Danish crops: oat, wheat, and barley from the 2010 harvest, and rye from 2011 harvest. The occurrence of the four enniatins were B>B1>A1>A. Enniatin B was detected in 100% of tested samples regardless of crop type. In addition to occurrence data, we report a proof-of-concept study using a human-relevant high-content hepatotoxicity, or “quadroprobe,” assay to screen mycotoxins for their cytotoxic potential. The assay was sensitive for most cytotoxic compounds in the 0.009–100 µM range. Among eight tested mycotoxins (enniatin B, beauvericin, altenuariol, deoxynivalenol, aflatoxin B1, andrastin A, citrinin, and penicillic acid), enniatin B and beauvericin showed significant cytotoxicity at a concentration lower than that for aflatoxin B1, which is the archetypal acute hepatotoxic and liver-carcinogenic mycotoxin. Hence, the quadroprobe hepatotoxicity assay may become a valuable assessment tool for toxicity assessment of mycotoxins in the future.

General information
State: Published
Organisations: National Food Institute, Research Group for Molecular Toxicology, Research group for Analytical Food Chemistry, Danish Veterinary and Food Administration
Pages: 1658–1664
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Environmental Toxicology
Volume: 32
Issue number: 5
ISSN (Print): 1520-4081
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.19 SJR 0.652 SNIP 0.717
Web of Science (2017): Impact factor 2.491
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.2 SJR 0.713 SNIP 0.809
Web of Science (2016): Impact factor 2.937
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.26 SJR 0.799 SNIP 0.883
Web of Science (2015): Impact factor 2.868
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.16 SJR 0.757 SNIP 0.985
Web of Science (2014): Impact factor 3.197
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.97 SJR 0.778 SNIP 0.91
Web of Science (2013): Impact factor 2.562
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.16 SJR 0.83 SNIP 0.956
Web of Science (2012): Impact factor 2.708
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.98 SJR 0.769 SNIP 0.797
Web of Science (2011): Impact factor 2.407
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.769 SNIP 0.792
Web of Science (2010): Impact factor 1.932
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.69 SNIP 0.856
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.792 SNIP 1.011
Scopus rating (2007): SJR 0.762 SNIP 0.964
Scopus rating (2006): SJR 0.853 SNIP 0.83
Scopus rating (2005): SJR 0.58 SNIP 0.716
Scopus rating (2004): SJR 0.586 SNIP 0.837
Scopus rating (2003): SJR 0.623 SNIP 0.792
Scopus rating (2002): SJR 0.754 SNIP 0.771
Scopus rating (2001): SJR 0.564 SNIP 0.777
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.589 SNIP 1.104
Scopus rating (1999): SJR 0.658 SNIP 0.917
Original language: English
DOIs:
10.1002/tox.22367
Source: FindIt
Source-ID: 2344891751
Research output: Research - peer-review  Journal article – Annual report year: 2016