ABSTRACT

Mycotoxins are secondary metabolites of moulds. Contamination of food and feed by mycotoxins is a major problem for human and animal health. Ingestion of mycotoxins may cause a range of toxic responses, from acute toxicity to long term or chronic health disorders. Several mycotoxins, either from the same or from different fungal species, occur simultaneously in plant products. However, its implication for food safety assessment is generally not known, as there is relatively little information on the interaction between concomitantly occurring mycotoxins and the consequence for the toxicity. Mycotoxins with similar mode of action would be expected to have at least additive effects. Conversely, some interactions could have subtractive effects. An understanding mode of action in simple *in vitro* systems can provide a rational basses for predicting interactions between mycotoxins. The aim of this study was to obtain cytotoxicity data (EC_{50} values) of *Penicillium* and *Fusarium* mycotoxins, nominally BEA, CIT, DON and T-2 toxin. For this purpose, Vero cells viability was evaluated in the presence of these four mycotoxins using the NR assay. All mycotoxins tested diminished cell viability in a concentration and incubation time-dependent manner on Vero cells. Individual mycotoxins increase cytotoxicity as follow: CIT< BEA< DON< T-2 toxin. To determine the mechanistic interactions of BEA, DON and T-2 toxin and their influence on cellular viability of Vero cells, were used the following combinations of mycotoxins: BEA in combination with DON, BEA in combination with T-2 toxin, DON in combination with T-2 toxin and combination of all three mycotoxins. All mixtures of mycotoxins tested reduced the viability of Vero cells. Our results indicate that the most cytotoxic effect on Vero cells was observed after the tertiary mixture of BEA, DON and T-2 toxin.

Key words: mycotoxins, Neutral red assay, Vero cells, cell viability, mechanistic interactions