COMPARISON BETWEEN ELISA AND UPLC METHODS FOR THE DETERMINATION OF T-2 AND HT-2 TOXINS IN WHEAT

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T-2 toxin (T-2) and HT-2 toxin (HT-2) are type A trichothecenes produced mainly by *Fusarium sporotrichioides*, *F. poae* and *F. langsethiae* that may develop on a variety of cereal grains, especially in cold climate regions or during wet storage conditions. Toxicity data have shown T-2 to be a potent inhibitor of protein synthesis and, at higher concentrations, of DNA and RNA synthesis. Due to the fact that *in vivo* T-2 is rapidly metabolized to HT-2, it is widely accepted that the *in vivo* toxicity of T-2 includes also the one of HT-2. The European Commission has recently adopted recommendations on the presence of T-2 and HT-2 in cereals and cereal products asking Member States to perform monitoring for the presence of these mycotoxins in cereals. An indicative level of 100 µg/kg has been fixed for the sum of T-2 and HT-2 in wheat. Different methods have been proposed for the determination of these mycotoxins in cereals: screening methods, including immunochemical assays such as enzyme-linked immunosorbent assays (ELISA) or more reliable chromatographic methods (i.e. HPLC, UHPLC). The aim of this study was to evaluate the reliability of an ELISA method (Veratox, Neogen) in the analysis of T-2/HT-2 in durum wheat. The limit of quantification of the assay was 25 µg/kg (sum of T-2 and HT-2). Two hundred sixty-four durum wheat samples of the 2011-2013 growing seasons in Italy were analyzed and the results compared with those obtained with a reference method based on immunoaffinity column clean-up and UPLC analysis. A good correlation was observed for all positives samples of durum wheat (r = 0.9639, n = 96, range of contamination 25-305 µg/kg). In general, the ELISA method overestimated T-2/HT-2 content as compared to the UPLC one (slope = 1.093). A low percentage of false positive (5.3%) and false negative results (4.5%) was observed, although no false positive/negative results were observed at levels of contamination ≥50 µg/kg (sum of T-2 and HT-2).In our opinion, validated ELISA methods can be used as screening methods for the determination of the sum of T-2 and HT-2 in wheat, although confirmatory analyses by more robust methods (such as UHPLC) are required for contamination levels that approach the indicative levels adopted by the European Commission.

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