DETERMINATION OF PYRANTEL EMBONATE AND ITS PHOTODEGRADATION PRODUCTS BY LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY

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The huge use of veterinary pharmaceuticals has led to increase of amount of these compounds in the environment. As they are introduced into the environment – directly by agriculture or aquaculture treatments or indirectly, excreted through urine or faeces of treated animals – parent compounds and their metabolites are exposed to variety of surrounding conditions which can cause their degradation. Photodegradation caused by sunlight is often complex involving a number of reactions which are often leading to multiple products that may be more toxic to organisms in the environment than the parent compound. Once in the environment, the identification of transformation products because of possible toxicity is of great importance.

The preferred technique for analysis of pharmaceuticals and their transformation products in the environment has become LC-MS. The advantage of LC-MS is its sensitivity and its suitability for determination of a wide range of compounds with very different polarities and masses. Since the atmospheric pressure ionization techniques, such as electrospray ionization (ESI), as a soft ionization method for chemical analysis were introduced, LC-MS has gained an increasingly important role in analysis of low concentrations in complex environmental matrices [1].

In this presentation analysis on tetrahydropyrimidine anhelmintic drug pyrantel embonate, deworming agent in the treatment of hookworms and roundworms was performed. Pyrantel embonate, applied in great quantities, has the potential to appear in surface waters. The main goal was to determine the parent compound and to find out whether it photodegrades under environmental conditions and if so, to perform determination and identification of the photodegradation products.

Water samples containing pyrantel embonate were exposed to UV light of 366 nm. The LC-DAD analyses were done on samples after each day of irradiation. The LC-MS\(^2\) (QqQ) analyses were done on samples after four-day irradiation. LC separation was achieved on a C\(_{18}\) (150 x 2.0 mm, particle size 4 \(\mu\)m) modified column Synergi Fusion-RP (Phenomenex, USA), gradient elution by binary mixture of solvents A (0.01% formic acid in water) and B (0.01% formic acid in acetonitrile) as a mobile phase. Samples were analyzed using electrospray as an ionization source in positive ionization mode, ESI(+)\(^\ast\). The results showed that pyrantel embonate, which is a salt of pyrantel and embonic acid, photodegrades and the main products are presented.

**Key words:** pyrantel embonate, photodegradation products, LC/MS analysis

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