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Development of an LC-MS/MS method for residues of antiviral drugs in egg and poultry meat

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Introduction

Antiviral drugs are active against Influenza type A virus which includes avian influenza (H5N1). Large scale use of these drugs in the poultry industry may give rise to resistance and thus render them useless for human medication. Misuse and subsequent resistance were reported for amantadine in Asia.

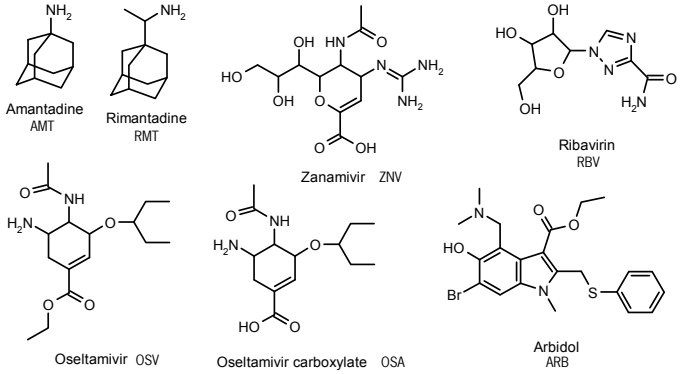

Fig. 1: Structures of some antiviral drugs

LC-MS/MS method

HPLC: Agilent 1100 series; column Symmetry C_{18}, 150x3 mm, 5 µm; gradient elution H2O/MeCN 50 mM HCOOH

MS: Waters Micromass Quattro Micro, ESI+ ionisation, MRM mode

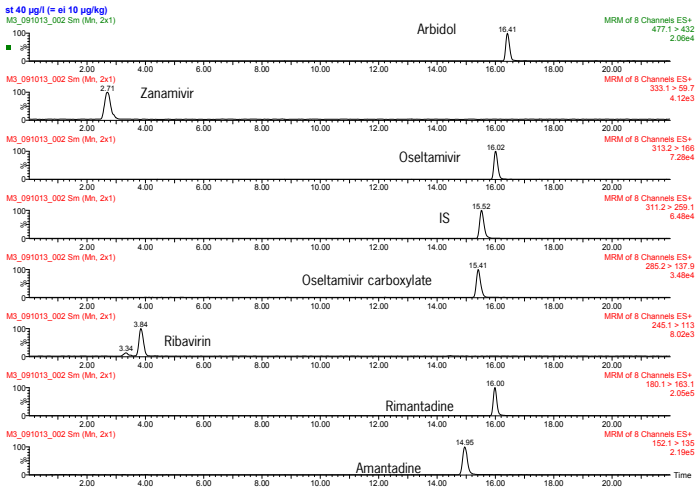

Fig. 2: Chromatogram of a solution of antiviral drugs

Results

Different extraction procedures were compared. Good results in buffer were obtained using ultrafiltration, ion exchange and HILIC SPE. In matrix (egg, poultry meat) ion exchange SPE and ultrafiltration showed the best extraction performance (table 1). Due to matrix interferences SPE was preferred over the ultrafiltration method (fig. 3).

	MCX 60 mg	MCX 150 mg	WCX 60 mg	X-C 200 mg	HILIC 200 mg	Ultra-filtration
AMT	15	17	5	5	1	69
RMT	10	9	20	5	1	39
OSV	45	40	30	35	0,5	50
OSA	70	45	0	50	5	103
ARB	20	10	25	10	0	1
ZNV	10	39	0	0	0	15
RBV	0	0	0,1	0	3	50

Table 1: Recovery (in %, against matrix-matched standards) from spiked egg samples of different extraction methods

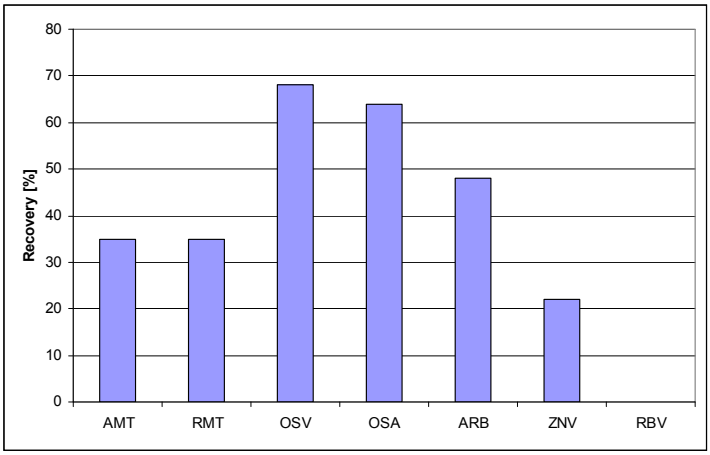

Fig. 3: Recovery (in %, against matrix-matched standards) from spiked egg samples of the selected extraction method (SPE MCX 60 mg)

Conclusions

- LC-MS/MS is suited to separate and quantify the target antiviral drugs at residue levels
- SPE with cation exchange sorbents yields promising recoveries for basic analytes, while for ribavirin a more tailored approach has to be developed
- The method is currently further developed and optimised

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