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Liquid chromatography tandem mass spectrometry for the doping control of beta-agonists and corticosteroids in racing pigeons

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Statement of the Problem: Pigeon racing is an ancient sport, practiced by fanciers all over the world, on a weekly basis. Although the natural skills of pigeons are truly amazing, with these birds traveling hundreds of kilometers for several hours in a row, fanciers still struggle to find strategies to improve them. Unfortunately, the use of performance enhancing drugs in racing pigeons is one of these common strategies, threatening animal welfare, compromising equality of opportunity and ensuring unfair financial gains for cheaters. Despite the existence of rules and legislation that forbidden the administration of drugs to pigeons for performance enhancing purposes, it is generally acknowledged that doping control is being neglected in several countries. The number of studies presenting analytical methods for the control of these illicit practices in pigeons is minimal, probably given the nature of the available analytical matrix (faeces), and the low dosages applied to these small animals. Methodology: A liquid chromatography tandem mass spectrometry method was developed and validated for the detection and quantification of a beta-agonist (clenbuterol) and three corticosteroids (betamethasone, prednisolone and budesonide) in faeces from pigeons, after an extraction protocol combining liquid-liquid extraction and solid-phase extraction. Main results: The newly developed method was validated concerning selectivity, linearity (with coefficients of determination always greater than 0.99), accuracy (87.5–114.9 %), inter-day and intra-day precisions, limits of detection (0.14-1.81 ng/g) and limits of quantification (0.49-6.08 ng/g), stability and extraction recovery (71.0 %-99.3 %). The method adequacy was evidenced after the unequivocal detection of betamethasone in faeces from two racing pigeons that had been orally administered betamethasone. Conclusion & Significance: The method performance is suitable for doping control analysis purposes and can be easily adapted to doping control laboratorial routine procedures in order to enforce current laws.

Biography

Fernando Moreira is a Professor at School of Health of Polytechnic Institute of Portugal and PhD student of Forensic Sciences in Medicine Faculty of University of Porto, currently developing control doping methods at the Toxicology Laboratory of Department of Biological Sciences of Faculty of Pharmacy of University of Porto. His expertise is in developing analytical methods for the detection and quantification of substances in complex biological matrices that also enables the clarification of pharmacokinetics events of drugs.

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