

Comprehensive metabolite profiling of trimetazidine in camels using high-Resolution accurate mass Spectrometry: implications for doping control

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June 24, 2023

Abstract

Rationale: Trimetazidine and its metabolites are prohibited substances in sports. With a growing number of adverse findings in human athletes, it is crucial to develop doping control strategies that include screening for trimetazidine in animal sports. This study aims to detect and characterize trimetazidine and its metabolites for doping control in camel racing. **Methods:** Camel urine and plasma samples were collected from four healthy animals following a single oral dose of trimetazidine. invitro studies utilized camel liver cells. Liquid-liquid extraction (LLE) and solid-phase extraction (SPE) techniques were employed for the extraction of trimetazidine metabolites from plasma and urine matrices, the metabolites were analyzed using a thermo Orbitrap exploris LCMS system with optimized settings to achieve maximum sensitivity and accurate mass measurements. **Results:** Comprehensive metabolite profiling of trimetazidine in camels revealed the identification of seven phase I and five phase II metabolites. Phase I metabolites were primarily formed through delacylation, while phase II metabolites were dominated by glucuronide conjugation of demethylated trimetazidine. The findings provided insights into the distinct metabolic pathways and biotransformation patterns of trimetazidine in camels under the experimental conditions. **Conclusion:** The developed method enables detection and characterization of trimetazidine and its metabolites in camels. The identified metabolites have the potential to serve as biomarkers for trimetazidine abuse in camel racing .this study provides valuable insights into the metabolism of trimetazidine in camels.

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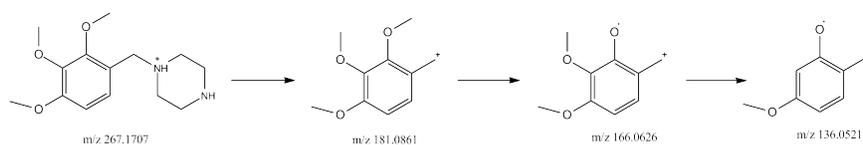


Fig-2 Proposed dissociation pattern of the protonated molecule[M+H]⁺ of trimetazidine

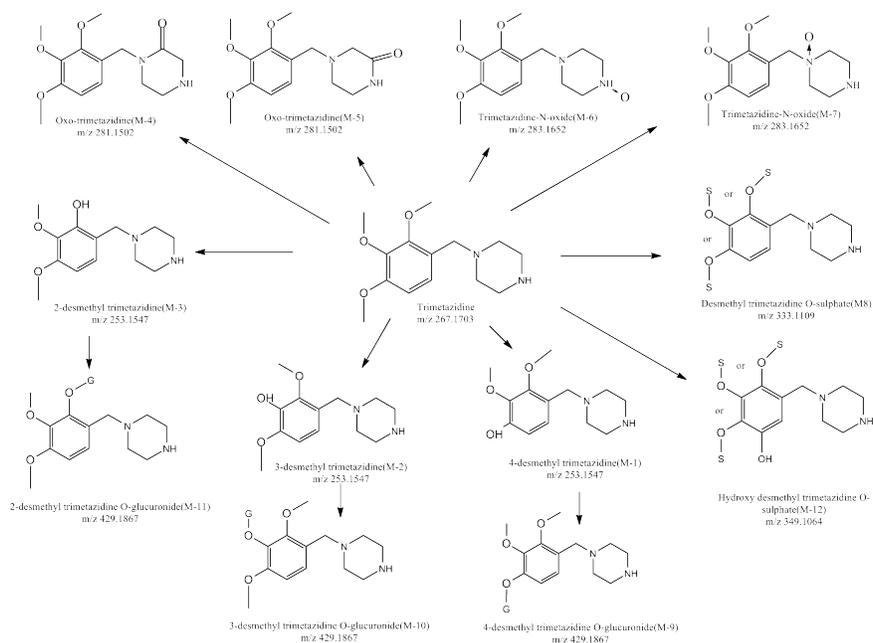


Fig-3 Proposed metabolic pathway of trimetazidine in Camel.

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