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Identification of 3-hydroxymethyl sulfentrazone in rats' urine

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The identification of adverse effects on environmental health caused by chemical agents is particularly challenging. Sulfentrazone, a phenyl triazolinone herbicide, is converted in soil of temperate regions, to 3-hydroxymethyl sulfentrazone (HMS) and has a high leaching potential both vertically and horizontally. It is also one of the most often used herbicides in tropical regions. However, the fate of this compound in these regions is not known. Given (a) the importance of knowing the environmental behavior of this herbicide in soils of tropical regions, (b) considering the commercial unavailability of the HMS, and (c) its low acute oral toxicity ($LD_{50} > 2855 \text{ mg.kg}^{-1}$); this compound was isolated from rat's urine after administration of the herbicide. The proposed mammalian metabolic pathway is the conversion of the parent compound mainly to 3-HMS (88-95%), which is excreted in the urine. For that, male Wistar rats were exposed to 100 mg sulfentrazone kg^{-1} of body weight diluted in olive oil. The control group was exposed only to the oil. The animals were kept in metabolic cages and the urine was collected in dry ice during 48 h. The HMS was purified by preparative HPLC and identified by mass spectrometry. HMS metabolite was identified as the peak that showed a mean retention time of 12.52 min. Since the HMS metabolite isolation from rats' urine was possible under low doses, it is necessary to determine in a next step the highest amount possible to be obtained in a dose that not cause damage to the rats.