



PRELIMINARY STUDY FOR THE EVALUATION OF THE HALF-LIFE OF THE HERBICIDE GLYPHOSATE AND ITS METABOLITE AMPA THROUGH BIOMONITORING IN URINE OF EXPOSED FARMERS

Carolina Weber Ferrareze¹; Mariana Arend Schmitt¹; Ana Paula Grando¹; Shanda Aparecida Cattani², Thainá Zanenga Silva², Simony Costa Beber²; Solange Cristina Garcia²; Rafael Linden¹; Mariele Feiffer Charão¹

¹Feevele University, Analytical Toxicology Laboratory, Novo Hamburgo - RS, ²Federal University of Rio Grande do Sul, School of Pharmacy, Porto Alegre - RS.

INTRODUCTION: Glyphosate is a widely used herbicide in global agriculture and in Brazil, however, several authors have reported various human health issues that may be related to exposure to glyphosate, particularly in occupationally exposed populations. Although knowledge about this herbicide is extensive in various fields, glyphosate's half-life remains under-studied, especially when it comes to determining the optimal timing for occupational biomonitoring sampling. **OBJECTIVE:** To detect and quantify glyphosate levels and its metabolite AMPA in the urine of exposed farmers, using samples collected at different exposure times. **MATERIALS AND METHODS:** The study population consisted of six male volunteer farmers, over 18 years old, from the cities of Rolante and Riozinho in Rio Grande do Sul, Brazil. Four urine samples were collected from each volunteer: before glyphosate use (Sample 1), at the end of the work shift (Sample 2), 24 hours (Sample 3) and 48 hours after the first sample (Sample 4). The methods used for analysis included derivatization with pentafluorobenzyl bromide (PFBBBr) and liquid-liquid extraction with methyl tert-butyl ether (MTBE). The equipment used was an Acquity I-Class ultra-efficiency liquid chromatograph coupled with a triple quadrupole mass spectrometer XEVO TQ-S Micro (CLUE-MS/MS). **RESULTS AND CONCLUSION:** In relation to Sample 1, all samples had non-detectable results, while for the Samples 2, the median found was 4.42 µg/L. The medians for the third and fourth samples were 1.93 µg/L and 2.82 µg/L, respectively. Two of the study participants had non-detectable results in all samples, however, one had no direct contact with the herbicide, and the other used a tractor with a closed cabin for application. Although this is a preliminary study with a limited sample size, it was possible to observe the influence of contact and the method used for application, as well as the timing of sample collection. This provided important information about the rapid elimination of glyphosate and the best timing for sampling in biomonitoring of herbicide exposure.

Key-words: glyphosate, AMPA, farmers.