

README file

Data Set Title: **Experimental data about mammalian sperm function and survival. Effects of Roundup and its main component, glyphosate**

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Data set Contents

The data set consists of a compressed folder, named **GLY_R_SPERM.zip**, containing:

- six files containing the raw data of flow cytometry and CASA analyses of semen samples incubated in presence of different concentrations (0–360 µg/mL) of glyphosate (GLY) or Roundup (R), at the equivalent GLY concentration for 3 h.
GLY_FC_live_AI_MP.ods
R_FC_live_AI_MP.ods
GLY_FC_AO.ods
R_FC_AO.ods
GLY_CASA.ods
R_CASA.ods
- a README file saved in .pdf format
README_GLY_R_SPERM.pdf

Abstract

The wide use of glyphosate-based herbicides (GBHs) has become a matter of concern due to its potential harmful effects on human health, including men fertility. The study investigated, using the pig as a model, the impact of pure glyphosate and its most known commercial formulation, Roundup, on sperm function and survival.

These data sets contain the raw data of the flow cytometry analysis of sperm parameters (sperm viability, acrosome integrity, mitochondrial activity and DNA fragmentation) and motility analysis by computer-assisted sperm analysis (CASA) of fresh commercial semen doses incubated with different concentrations (0–360 µg/mL) of glyphosate (GLY) or Roundup (R), at the equivalent GLY concentration for 3 h.

Content of the files

- File **GLY_FC_live_AI_MP.ods** contains the row data of flow cytometry (FC) analysis of sperm viability (live), acrosome integrity (AI), mitochondrial potential (MP) of semen samples incubated in presence of different concentrations (0, 5, 25, 50, 100, 360 µg/mL) of glyphosate (GLY) for 3 h. Sperm parameters, assessed after 1h and 3h of incubation at 38 °C, were evaluated twice for each treatment at both evaluation times (5 replicates).
- File **R_FC_live_AI_MP.ods** contains the row data of flow cytometry (FC) analysis of sperm viability (live), acrosome integrity (AI), mitochondrial potential (MP) of semen samples incubated in presence of different concentrations (0, 5, 25, 50, 100, 360 µg/mL) of Roundup (R), at the equivalent GLY concentration for 3 h. Sperm parameters, assessed after 1h and 3h of incubation at 38 °C, were evaluated twice for each treatment at both evaluation times (5 replicates).
- File **GLY_FC_AO.ods** contains the row data of flow cytometry (FC) analysis of DNA fragmentation using acridine orange (AO) of semen samples incubated in presence of different concentrations (0, 5, 25, 50, 100, 360 µg/mL) of glyphosate (GLY) for 3 h. Spermatozoa were evaluated with FL1 and FL3 filters for green (double-stranded DNA, dsDNA) and red (single-stranded DNA, ssDNA) fluorescence, respectively (two evaluation for each treatment at both evaluation times, 5 replicates).
- File **R_FC_AO.ods** contains the row data of flow cytometry (FC) analysis of DNA fragmentation using acridine orange (AO) of semen samples incubated in presence of different concentrations (0, 5, 25, 50, 100, 360 µg/mL) of Roundup (R), at the equivalent GLY concentration for 3 h. Spermatozoa were evaluated with FL1 and FL3 filters for green (double-stranded DNA, dsDNA) and red (single-stranded DNA, ssDNA) fluorescence, respectively (two evaluation for each treatment at both evaluation times, 5 replicates).
- File **GLY_CASA.ods** contains the row data of sperm motility evaluation with a commercial computer-assisted sperm analysis (CASA) of semen samples incubated in presence of different

concentrations (0, 5, 25, 50, 100, 360 µg/mL) of glyphosate (GLY) for 3 h (3 replicates of 1,000 spermatozoa each treatment).

- File **R_CASA.ods** contains the raw data of sperm motility evaluation with a commercial computer-assisted sperm analysis (CASA) of semen samples incubated in presence of different concentrations (0, 5, 25, 50, 100, 360 µg/mL) of Roundup (R), at the equivalent GLY concentration for 3 h (3 replicates of 1,000 spermatozoa each treatment).

Methodologies

In each experiment, semen (30×10^6 spermatozoa/mL) was added with (0, 5, 25, 50, 100, 360 µg/mL) of glyphosate (GLY) or Roundup (R), at the equivalent GLY concentration and then incubated at 38 °C for 3 h. After 1 h and 3 h of incubation:

- sperm motility was evaluated with a CASA system (Integrated Sperm Analysis System V1.0; Proiser), following the settings described by Yeste et al., 2007 (<https://doi.org/10.1016/j.anireprosci.2007.11.003>);
- viability (SYBR14/PI staining), mitochondrial membrane potential (JC1 staining), acrosome integrity (PNA-FITC/PI staining) and DNA fragmentation (AO staining) were evaluated through a Cell Laboratory QuantaSC cytometer (Beckman Coulter). All fluorochromes were purchased from Invitrogen Molecular Probes (Thermo Fisher Scientific). Data files, cytometric histograms and dot plots were analysed with Lab QuantaSC MPL Software (version 1.0; Beckman Coulter).

Notes

This data set contains data presented in the following publication:

Nerozzi C, Recuero S, Galeati G, Bucci D, Spinaci M, Yeste M. Effects of Roundup and its main component, glyphosate, upon mammalian sperm function and survival. Sci Rep. 2020;10(1):11026. <https://doi.org/10.1038/s41598-020-67538-w>