

Sublethal doses of Roundup negatively affect a non-target invertebrate

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Video Byte

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Abstract

Roundup is the most widely used non-selective herbicide, but it's also one of the most controversial on the market. Much evidence about Roundup's safety is based on toxicity tests that, despite being outdated, are routinely used by regulators and say little about the long-term, sublethal effects of Roundup or its active ingredient glyphosate. Now, a new study has taken a systems biology approach to examine the effects of Roundup on organisms at the genomic and fitness level. *Daphnia* are not a Roundup target but are exposed to the herbicide through run-off from farmlands and they are central to aquatic food webs. In the lab, *Daphnia* were exposed to the regulatory threshold concentration of glyphosate and Roundup. Researchers found that chronic exposure to either chemical had highly detrimental effects including embryonic developmental failure, DNA damage, and signaling interference. *Daphnia* also showed changes in their microbiome and disruptions in metabolism. The "Reactome" pathway analysis tool identified conserved targets of concern in other organisms. These results highlight the risk that chronic exposure to Roundup and glyphosate, even at the regulatory threshold, may pose to aquatic ecosystems and provides targets for future research into other non-target organisms which may be affected by Roundup.