OFFICIAL ABSTRACT and CERTIFICATION

Analysis of the Effect of the Herbicide, Glyphosate, on Parkinson's Disease Related Gene Expression in Caenorhabditis elegans and Drosophila melanogaster

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The purpose of this experiment was to analyze the effects of the herbicide, Glyphosate, in Roundup on Parkinson's Disease (PD) related gene expression in Caenorhabditis elegans and Drosophila melanogaster. Glyphosate is a non-selective chemical agent used to inhibit plant growth in agricultural practices. PD is a progressive neurodegenerative disorder of the nervous system that heavily impacts movement. In recent years, people have become ill after exposure to herbicides like Roundup on their lawns while the companies who produce the chemicals deny the allegations (Bellon 2018). Since many crops that feed the world's population are sprayed with herbicides it is important to confirm its ties to diseases like Parkinson's. C. elegans and D.melanogaster can be used to demonstrate how the herbicide affects Parkinson's related gene expression by amplifying the human genes homologous to the development of Parkinsonâ€™s like PINK1, PARK7, and LRRK2. These organisms had their RNA extracted, via Trizol Protocol, and amplified through Reverse-Transcriptase Polymerase Chain Reaction (rtPCR) to test if their gene expression was altered in the presence of Glyphosate. These methods can be developed further for use in the study of other diseases as well. The results of this experiment could potentially influence how farming is conducted in the future and encourage the safe practice of horticulture to prevent rising occurrences of PD worldwide.

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