

AMARIS JALIL and CAROL ZYGAR PLAUTZ, Dept. of Biology, Shepherd University, Shepherdstown, WV, 25443. Diquat dibromide-induced developmental abnormalities in the pond snail *Lymnaea palustris*: investigations into cellular targets and the role of calcium regulation.

We have established that the herbicide Roundup and its constituents are capable of causing developmental abnormalities and death in the pond snail *Lymnaea palustris*. Diquat dibromide (DD) has been identified as the Roundup constituent most consistently associated with developmental delays, embryonic abnormalities and lethality. However, the mechanism of DD action on live embryos remains to be discovered.

DD-treated embryos experience delayed development, loss of cell-cell adhesion, and irregular spinning patterns, possibly resulting from calcium dysregulation in ciliary motility. Notably, adult snails treated with DD exhibit weakening of their shell, also a calcium-dependent structure. Concurrent treatments of varying concentrations of calcium together with DD were conducted in order to determine how altered levels of calcium availability in the medium influence embryonic progression. It was found that DD-treated embryos in low-calcium media experienced less phenotypic abnormalities compared to high-calcium and calcium ionophore treated embryos. Additionally, embryos in calcium-free medium containing DD exhibited more normal development overall compared to embryos in calcium-free medium without DD.

These results strongly suggest that calcium dysregulation plays a role in the developmental abnormalities and death observed in embryos treated with DD. Experiments are being conducted to determine if DD exerts an increase in intracellular calcium through influx, inhibition of calcium release, or upregulation of calcium release from intracellular stores. Alternatively, there may be a different role of DD in modulating calcium regulation.

*This work was funded in part by the Research Challenge Fund through a Summer Undergraduate Research Experience Grant from the West Virginia HEPC Division of Science and Research*