

PREETHA S. PHILLIPS, PRIYA ARUMUGANATHAN, COLLEEN J. NOLAN, and CAROL Z. PLAUTZ, Department of Biology, Shepherd University, Shepherdstown, WV, 25443. **The effects of roundup and its constituents on steroid hormone levels in the snail *Lymnaea palustris*.**

Roundup, a commonly used herbicide, has been shown to have adverse effects on different non-target organisms, particularly on reproduction and development. Roundup has been demonstrated to affect the steroidogenic pathway, specifically the rate-limiting step in steroidogenesis, steroid acute regulatory protein (StAR). Previous research in snails demonstrated significant reduction in fecundity and increase in developmental abnormalities as a result of exposure to Roundup; preliminary results also suggested that Roundup impacted the production of steroid hormones derived from cholesterol, including the sex hormones. The present study aimed to determine a possible target in this pathway in order to understand the mechanism of disruption by the chemicals. This was done by treating *Lymnaea palustris*, an aquatic snail, with Roundup or its constituents (POEA, glyphosate, and diquat dibromide) for six weeks. Cortisol, testosterone and estradiol levels in the hemolymph were analyzed using enzyme-linked immunosorbent assay (ELISA) kits.

Throughout the six-week treatment period there was a significant decrease in reproduction among the snails in all treatment groups. The snails treated with complete Roundup and diquat dibromide showed significant decreases in both testosterone and estradiol levels. These could be related to the decrease in StAR activity (leading to less overall material for steroid hormone production), or possibly a disruption in aromatase activity. Snails treated with glyphosate exhibited a significant decrease in testosterone, significant increase in cortisol, and a notable increase in estradiol; these results suggest a shift in the steroidogenic pathway to produce more stress hormone at the expense of steroid sex hormones.