Effects of Treatment of Reduced Glutathione on Budding and Feeding Rates in Hydra littoralis

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The freshwater organism, Hydra littoralis, has served as an effective model for biochemical, behavioral, reproductive, and environmental studies. When well-fed, hydra reproduce asexually by budding but when conditions are not ideal, they switch to sexual reproduction. The goal of my research has been to explore the potential use of reduced glutathione as a way to increase the budding and feeding rates in Hydra Littoralis in order to increase the effectiveness of hydra's use in various fields of scientific research. This project was composed of three experimental phases. In the first phase, fed and unfed Hydra littoralis were exposed to different concentrations of reduced glutathione to examine the effects of this tripeptide on budding rates. In the second phase, hydra were provided with differing densities of brine shrimp to determine the relationship between feeding rates were dependent on shrimp density. In the third phase, hydra were simultaneously exposed to 8 brine shrimp and different concentrations of reduced glutathione to ascertain the effects of glutathione on feeding rates. After analyzing the results, it was found that reduced glutathione decreases budding rates, particularly at high concentrations. It was also determined that feeding rates were highest at a prey density of 8 brine shrimp. This density was used to confirm that the reason budding rates decrease with glutathione treatment is likely due to a decreased feeding rate following treatment with glutathione. Elucidating the proximate and ultimate effects of glutathione on budding rates in these basal metazoans increases our understanding of the evolution and function of some of the most highly conserved aspects of neurophysiological signaling in animals.

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