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Abstract:**Antioxidants Boost Male Fertility: The Role of Reactive Oxygen Species (ROS) in Modulating Fertility and Sperm Viability in *Drosophila melanogaster***

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Reactive oxygen species (ROS) in large amounts have been shown to cause peroxidative damage. Large amounts of ROS are produced in stressful environments, such as after exposure to toxins. Antioxidants have been previously used to reduce lifespan-related peroxidative damage inflicted by reactive oxygen species in the common fruit fly. It is possible that antioxidants can also reduce the damaging effects of reactive oxygen species to rescue pre-copula and post-copula reproductive efforts in *Drosophila melanogaster*. It is hypothesized that if male fruit flies are fed antioxidant-enriched diets prior to a reactive oxygen species assault, then the antioxidants will quench the reactive oxygen species to decrease lipid peroxidation damage to male sperm, resulting in increased pre-copula and post-copula reproductive efforts. Two groups of fruit fly food were each infused with lipoic acid (2.15mM) or melatonin (0.43mM) in 75% ethanol. 75% ethanol solution was used as a control. Data analysis of pre-copula data (mating probability, sperm viability, copula duration) and post-copula data (number of offspring) was conducted using one-way ANOVA and Tukey's post-hoc tests. Results showed significant differences between treatments in sperm viability and number of offspring. However, there were no significant differences in mating probability or copula duration (both related to pre-copula sexual selection). Antioxidant levels in the fruit fly tissue were also monitored throughout the experiment using an antioxidant assay, which is still underway as of the writing of this abstract.

Key Words: Antioxidants, reactive oxygen species, Drosophila melanogaster, insects, fertility, sperm viability, sexual selection, reproduction.