The Effects of Hyperoxia on Drosophila Development

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This experiment is significant because it investigates the effects of the carboniferous period's atmospheric O2 levels on arthropod development and attempts to experimentally support the theory that higher oxygen concentrations were responsible for the much larger arthropods of the period, such as the relative of the dragonfly, Meganeura. In this project two types of air with concentrations of oxygen matching the peak of the carboniferous period, and a concentration between that of today and that of the carboniferous were prepared. The control group received normal air. A first generation of ten Drosophila melanogaster were added to each of three bottles, which were then filled with one of the three types of air. The final mass and wing cell density of the second generation flies were recorded. It was hypothesized that higher concentrations of oxygen would result in a greater final mass of the flies, and a decrease in cell density of the flies' wings. The data for both final mass and wing cell density followed clear patterns in line with those predicted in the hypotheses. Additionally, ANOVA tests comparing the three test groups returned statistically significant results. As such, the data fully supported both hypotheses and they were accepted.