Environmentally Induced Epigenetic Transgenerational Inheritance and Gender Dominance in Locomotory Behavior of D. melanogaster

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Environmental factors have a significant impact of the biological world. Much scientific research has focused on the adverse effects of endocrine disrupting compounds on wildlife and humans. The purpose of this study was to evaluate whether exposure to an endocrine disruptor, Ethinyl estradiol, multigenerationally in Drosophila melanogaster would result in changes in larval foraging behaviors, offspring numbers, and gender dominance in exposed populations as well as in subsequent generations after Ethinyl estradiol was removed. The study exposed Drosophila melanogaster to Ethinyl estradiol for seven generations in three concentrations: (E=10mcg/L), (E=20mcg/L) and (E=70mcg/L) and compared to a control. After the seventh generation, Ethinyl estradiol was removed and five subsequent generations observed. The locomotion of in-star larval path was studied in terms of rover (long path) and sitter (short path), offspring numbers, and male/female ratios for both sitters and rovers were also analyzed. A parallel “sitter only” population was bred for six generations to test foraging behavioral responses in the absence of food. The findings suggest that the presence of Ethinyl estradiol does impact the approximate phenotypic frequencies of larval forage polymorphisms rover/sitter in exposed populations and in subsequent populations after the removal of Ethinyl estradiol as well as impacting offspring numbers when compared to the control.

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