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Effect of metabolites on starvation and longevity in a natural population of *Drosophila ananassae*

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Metabolites, such as lipids and carbohydrates have pivotal roles on longevity and starvation and vary differently in natural and laboratory populations of *Drosophila*. A natural population of *Drosophila ananassae* has been subjected to starvation resistance and paraquat induced longevity in both sexes of early eclosed, old and control virgin flies and tested for carbohydrate, lipid and water contents; body size, dry weight and polymorphic inversions. Starvation resistance varies significantly (P <0.02) between males and females as the latter has more water contents than males (P <0.0002). The lipid and water contents suggest sexual dimorphism and show the metabolic trade-off for old females only. The carbohydrate contents in both sexes have significant differences among groups (P <<0.0001). The longevity is negatively correlated with body size but shows positive correlations with dry weight and starvation resistance in both sexes. Early eclosed males live longer than their females (P <0.002). The three-way nested ANOVA suggests that among groups as well as within subgroups, thorax length, starvation resistance, and longevity vary significantly (P <<0.0001) in both sexes. Correlation studies with different polymorphic gene arrangements and longevity suggest positive correlations for 2L and 3L gene arrangements and a negative correlation for 3R gene arrangement. The 3R gene arrangement is perfectly correlated with longevity in males. The 3L gene arrangement shows significant (P <0.05) positive correlation with the dry weight in females.

Keywords: Inversions, Longevity, Starvation