

Abstract

Microbiota Composition Affects Life History Traits in *Drosophila* Species †

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Abstract: Life history traits determine the survival of species and their reproduction and as such, they represent the main components of fitness. There are numerous factors that can affect life history traits, both external and internal. We investigated the influence of the composition of microbiota on two life history traits, egg to adult viability and developmental time, in two species, *Drosophila melanogaster* and *Drosophila subobscura* grown in laboratory on standard (over 50 generations) and lead (II) acetate ($\text{Pb}(\text{CH}_3\text{COO})_2$) saturated substrates (over 30 generations). The composition of microbiota in larvae and adults was determined by sequencing (NGS) of the V3-V4 variable regions of the 16S rRNA gene. The relationship between changes in the composition of microbiota and studied traits was analysed. The substrate \times species interaction shows a significant effect on both fitness components. In *D. subobscura*, developmental time shows a higher tendency of slowing down on lead saturated substrate compared to *D. melanogaster*. Reduced viability in *D. melanogaster* could be a cost of faster development and presence of endosymbiotic bacteria (*Wolbachia*). Microbiota diversity indicates that the high prevalence of genus *Komagataeibacter* could be a key to better tolerance of lead pollution in *D. subobscura*. The study of additional factors that may affect the composition of the microbiota, and consequently the potential trade-offs among different life history traits is of great importance in evolutionary research.

Keywords: *Drosophila melanogaster*; *Drosophila subobscura*; egg to adult viability; developmental time; microbiota composition